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The Future of the Natural Gas Market: Regulation and Prices

This article will describe the forces that drive natural gas regulatory policy. Federal gas policy will be affected by three underlying principles:

1. Only regulate where it's necessary. That means restricting regulation to cases where abuse of monopoly power is possible. Under normal market conditions the threat of such abuse is limited by the existence of competition. Competition drives prices down to marginal costs. Where possible, competition should be fostered to allow for the removal of existing regulation. This is a policy that has been followed in recent times. Under the Natural Gas Policy Act of 1978,¹ sixty percent of domestic natural gas prices have been deregulated at the wellhead.
2. Natural gas has become a tangible energy community. Gas now faces stiff competition with other fuels for market share. Fuel switching capacity has become quite extensive—twenty-five to thirty percent of the market can switch fuels in the short-run, while thirty-five to forty percent can switch in the long-run. Gas no longer has a special protected niche in the market.
3. Pipeline companies are in two separate lines of business: the transportation business, and the gas merchant business. Regulators now see pipeline companies differently than they did in the past, when they viewed pipelines as being in one line of business—the gas business. As transporters, gas pipelines have inherent market power. They have control over a necessary facility in the gas market. This aspect of the pipeline industry needs to be regulated. As merchants, however, they have no inherent market power. Pipeline companies generally produce little of the gas they sell. They merely serve as aggregators of supplies produced by others. If other merchants are allowed to use the pipeline's facilities, they can perform the same aggregation function. In the past, however, pipelines have been able to gain undue market power over gas sales by denying their competitors the facilities that connect points of production and consumption.

What are the implications of these principles? First, the emphasis by state and federal regulators should be to remove barriers to competition.

1. Natural Gas Policy Act of 1978, 15 U.S.C. §§ 3301-3432 (1982).

We need to provide more tools, and more flexibility, for firms to compete for market share in changing market conditions.

Second, we will be concerned with guarding against pipelines leveraging their market power over transportation to gain unwarranted market power over gas sales. This will involve a marriage of regulatory principles with anti-trust principles. Regulatory principles are aimed at controlling the use of existing market power. These tools must be used to control pipeline transportation rates and practice. Anti-trust principles, in contrast, are aimed at preventing the accumulation of pipeline market power over gas sales.

As we move from a highly regulated gas market to a more competitive gas market, one will see a substantial increase in private anti-trust litigation. For example, Colorado Interstate Gas Pipeline was recently awarded treble damages as a result of anti-trust action against Natural Gas Pipeline.² Private anti-trust actions may ultimately be more important than the FERC in preventing the exercise of monopoly power by pipelines over gas sales.

Finally, the FERC will undertake an examination of the relationship between the pipelines and their affiliated suppliers. Chairman Martha Hesse has announced that the Commission will address this issue in a soon-to-be issued Notice of Inquiry into possible abuses and remedies.

In summary, the FERC is now adapting regulatory practice to fit the new economic environment in the gas industry. Unfortunately, we face numerous obstacles in the process. Our principle authority is derived from the Natural Gas Act,³ which is now more than 50 years old. This Act is based on still older statutes and regulatory principles, as a result, we frequently encounter difficulties accomodating these old principles in the modern context. There is extensive legal precedent that we cannot simply shrug off, which acts as a constraint on the kinds of modifications of regulatory and anti-trust principles which have been described.

FUTURE OF GAS PRICES AND SUPPLIES

Today we are confronted with surplus supply and suppressed prices. But what happens when the bubble bursts?

The term "gas bubble" is an expression which suggests that we have a surplus of domestic natural gas supplies. Even a cursory review of the gas reserve data shows that this is not the case. Indeed, if anything we are facing a shortage rather than a surplus in gas supplies. The U.S. proved reserves have decreased from a high of 293 tcf in 1967 to 185

2. Colorado Interstate Gas Pipeline v. FERC, 791 F.2d 803 (10th Cir. 1986).

3. Natural Gas Act of 1938, 15 U.S.C. §§ 717-717w (1982).

tcf in 1986. If unmarketable Alaska north slope gas is excluded from the reserve figures, the total proved reserve figures are further reduced to 152 tcf. Far from experiencing a build up in gas supplies, we have witnessed a steady decline in our natural gas reserve base.

Thus today's bubble is not a surplus of reserves. Instead, it is little more than a temporary surplus in gas deliverability. In short, despite the gradual decline in gas reserves, on any given day gas producers currently are capable of delivering gas supplies in excess of total market demand.

The emergence of today's deliverability surplus was caused by a variety of factors, including the following:

1. The partial deregulation of wellhead gas prices under the Natural Gas Policy Act forced natural gas into direct competition with other primary fuels for the industrial energy market. During the gas shortages of the late 1970s, many boiler fuel users of gas were forced to equip their plants to burn fuel oil as a backstop against natural gas curtailments. Today the high price of gas relative to fuel oil, caused in part by the complicated incentive pricing scheme of the NGPA, has temporarily priced gas out of the boiler fuel market in some areas. In 1986 alone, natural gas lost approximately .9 tcf in sales to fuel oil.
2. Higher gas prices have stimulated conservation in all segments of the gas market.
3. The economics and technology of gas production have changed such that producers now have the physical ability and the economic incentive to drain gas reservoirs at much higher rates of production. This is especially true for wells in the federal outer continental shelf, where production rates are unhampered by state conservation or rateable take laws and where high exploration and development costs require a more rapid recovery of investment.
4. The infill drilling incentives of the NGPA increased the deliverability of many interstate reservoirs without appreciably adding to the overall reserve base.
5. There have been significant improvements in the infrastructure for moving imports of Canadian supplies into domestic markets, and changes in U.S. and Canadian energy policies have paved the way for greater levels of gas imports.
6. Since the mid-1970s, domestic gas storage capacity has increased by approximately twenty-five percent. This increase in total storage has masked any temporary shortfall between natural gas deliverability and consumption during periods of peak demand.

Although many of these factors are still at work, other more powerful forces—primarily the drop in exploratory drilling—are gradually deflating the deliverability bubble. For example, Merrill Lynch has predicted, based

on drill rig activity in 1986, that the industry replaced only thirty-seven percent of the supplies produced last year.⁴

This leads to the question of *when* will the bubble end? To be more precise, when will the gas industry be unable to satisfy the peak demands of the market? I should state at the outset that the FERC has not attempted to forecast the duration of the deliverability surplus. Most of the Commission's data gathering and analysis functions were transferred to the Energy Information Agency in 1977 by the DOE Organization Act. As a consequence, I have no special resources to bring to bear on this question. Like many in the gas industry, however, I have reviewed studies done by others and am prepared to accept the view that the bubble, as I have defined it, could end within one or two winter heating seasons—depending on the severity of the weather. Members of the Texas Railroad Commission recently have expressed concern that the margin between peak season deliverability and peak demand has become dangerously thin in the Texas intrastate market. They predict possible spot shortages next winter if prolonged frigid temperatures are experienced. Others have made similar predictions for the interstate market, although most appear to agree that the outlook for the interstate market is somewhat rosier than that forecasted for Texas by the Railroad Commission. What is significant about these predictions is that we are sufficiently close to a peak season supply shortage that weather conditions could determine the difference between a surplus and a temporary shortage.

Other reputable forecasters predict a more protracted life span for the gas bubble. For example, the American Gas Association has predicted that the bubble will continue until at least 1990, and perhaps even longer if so-called "supplemented supplies" are taken into account.⁵ But I believe that AGA has defined the bubble differently than I have. Instead of forecasting when *peak* demand will exceed *peak* deliverability, they have predicted when *annual* demand will exceed *annual* deliverability. While AGA's forecast may be correct as far as it goes, we probably will encounter winter deliverability problems—and therefore the end of the bubble as I have defined it—long before the period in which AGA predicts equilibrium between annual supply and demand.

As to where seasonal shortages are likely to occur first, my best guess is the Gulf Coast area. This region was picked for two reasons. First, it has relatively little gas in storage. Most of the U.S. gas storage capacity is located near the large consuming areas of the upper midwest, east coast and California. As a result, gulf coast consumers are highly dependent on wellhead deliverability to satisfy their needs. Second, when frigid

4. Cited in 17 INSTITUTE OF GAS TECHNOLOGY, GAS HIGHLIGHTS 17(1) (1987).

5. AMERICAN GAS ASSOCIATION, GAS ENERGY REVIEW: AGA 1987 OUTLOOK (1987).

weather hits the gulf coast, demand increases at the same time that deliverability decreases. This is because the same cold weather that causes homes and business to turn up their thermostats also causes gas wells to freeze over. The simultaneous occurrence of demand peaks and well freeze-overs could lead to shortages during the next prolonged cold spell. Fortunately, this region has been spared from unusually harsh weather in the past three years. But a near shortage in the Texas intrastate market was narrowly avoided in 1983.

Today ninety-nine percent of all electric utility gas boilers and fifty-six percent of all industrial gas consumers have dual fuel capability. Between thirty to forty percent of the total gas market is subject to fuel switching over short- or medium-term periods. This competition for the boiler market has led to the intergration of gas and oil markets.

Because of this integration, the experience of the late 1970s will not be repeated during the next natural gas deliverability shortage. As supplies begin to tighten during the peak winter heating season, prices under spot and short-term contracts will begin to creep upward. As soon as the delivered cost of spot gas exceeds that of residual fuel oil, some dual fired boiler users will immediately switch to oil. If shortages still persist, spot prices will rise a few more cents and additional boiler fuel users will switch. This process of shrinking the gas boiler fuel market will continue until supply and demand are brought into balance. The net result is that instead of factories closing their doors as they did in 1975 and 1976, spot prices will increase slightly and dual fired facilities will switch from gas to fuel oil. Gas-dependent customers will be little affected by the seasonal shortages until the boiler fuel market has been essentially backed out.

These initial curtailments will occur as a result of market pressure, not regulatory intervention. Federal curtailment policies will not come into play until after a substantial portion of gas consumers have voluntarily left the system.

In addition, shortages will be more evenly distributed throughout the pipeline grid, thereby lessening the threat of deep shortages on any one system. In the 1970s, some pipelines were curtailing essential gas uses while nearby pipelines were continuing to serve boiler fuel users. The hardships and economic cost of curtailments were exacerbated because shortages were concentrated on a handful of pipelines. This will not occur again for a variety of reasons, including more flexible transportation, abandonment regulations, and the current trend away from the rigid, long-term gas purchase contracts of the past. Today, supplies are more free to respond to market pressure and flow to the points of greatest need.

Gas prices will respond to peak shortages. As previously mentioned, the delivered price of spot gas will creep above that of residual fuel oil. This is consistent with the normal rule of thumb that shortages result in

higher prices. But keep in mind that gas companies are now selling into an integrated hydrocarbon market. They are no longer selling gas: they are selling Btus. As long as there is not a shortage of primary fuels (that is, gas and oil), boiler fuel prices should not rise appreciably. During modest peak season curtailments, gas will continue to be priced at a level that backs out some but not all of the boiler fuel market.

Significant price increases will occur only during peak shortages that are deep enough to displace most natural gas boiler fuel users. Given the flexibility in today's market for spreading out shortages over the entire pipeline network, it is unlikely that curtailments of this magnitude will occur within the next three to four years. Furthermore, even if deep shortages do occur, the resulting price increases will be short-lived. Once peak season demand subsides, excess deliverability will reappear and spot gas prices will naturally seek the level of the alternative marginal supplies (in this case, fuel oil). In many cases, the alternative supplies may come from competing sellers of gas, in which case gas prices could be driven below the cost of fuel oil. Thus, we will see seasonal swings in spot gas prices.

This is not to say that, except for periods of deep curtailment, *all* gas prices will be perpetually capped by the price of fuel oil. I expect that as peak shortages begin to appear, firm gas users will begin to offer premium prices to lock up limited gas supplies during peak months. The greater the threat of shortages, the greater the premium that essential users will be willing to pay. Such a premium will be limited by the value of the lowest cost alternative supplies for the next large group of gas users (perhaps No. 2 fuel oil). But even essential gas users will be unwilling to pay a premium for supplies delivered during non-peak periods.

Thus for the near- and mid-term future, average gas prices will remain limited by the price of fuel oil plus a modest premium (for peak supplies, both firm and interruptible). With prices so limited, the incentives available to producers to respond to seasonal gas shortages will be determined in large part by the vagaries of the international crude oil market.

Forecasting oil prices is part economics and part political science. Although I am neither an economist nor a political scientist, I will nonetheless offer an opinion on the subject. Despite the recent success of the OPEC ministers in reaching an accord on oil prices and production levels, I believe that it is unlikely that OPEC will be able to stabilize oil prices for any extended period. I say this because I see a variety of irresistible forces currently at work to undermine any agreement to stabilize prices. These forces include the following:

1. Most major petroleum exporting nations are facing serious budget problems resulting from the decline in oil prices and overly am-

bitious revenue commitments made during the heyday of inflated oil prices. With a near desperate need for cash flow, there is great temptation to covertly circumvent the voluntary OPEC production restraints. This temptation is exacerbated by the lack of a uniform system of accounting for country by country production figures, or enforceable sanctions against cheaters.

2. Total worldwide crude production capacity exceeds demand by eight to ten million barrels per day [mbd]. Although OPEC producers are responsible for ninety-five percent of this surplus capacity, it is extremely difficult to keep that much oil off the market. Furthermore, OPEC's share of the surplus is not evenly distributed among the OPEC member countries. For example, the average OPEC member is producing at approximately sixty percent of capacity while Saudi Arabia is producing at forty-one percent (3.75 mbd out of a total capacity of 9 mbd). The uneven allocation of the production restraints creates internal conflicts that undermine the current agreement.
3. Not only is there a current surplus in production capacity, but several OPEC producers (primarily those in the Persian Gulf) could develop significant additional reserves for a matter of pennies. For example, Saudi Arabia is presently producing from only fifteen of its fifty known fields.
4. At some point, the Iran and Iraq conflict will draw to an end. Regardless of who wins, there will be a desire to rebuild the production facilities and reclaim the market share held by the two countries before the war. This could either result in more oil being dumped on the market or, at the very least, it could create additional tension within the OPEC ranks.
5. Many of the OPEC members have conflicting strategic needs that they seek to further through the OPEC pricing policies. For example, members with extensive reserves seek to establish moderate prices that will increase the long-term market share of crude oil. OPEC members with rapidly depleting reserves, in contrast, seek a high price policy to maximize short-term revenues while their reserves hold out.

The combined effect of these and other factors will likely result in unstable and relatively low oil prices in the immediate future.

This brings us back to the question of natural gas supplies in the wake of the current bubble. Investment decisions by gas producers will be affected by both the anticipated price for future supplies and by the degree of confidence the producer, and his investors or lenders, have that the anticipated price actually will be realized. I am aware of studies by the Gas Research Institute and others which suggest that we will be able to sustain sufficient North American gas production to supply anticipated market needs with oil prices that gradually inflate from \$20 in 1987 to

approximately \$27 in the year 2000.⁶ Not being an expert on the subject, I have no basis to question their forecasts. I am concerned, however, that a lack of producer and lender confidence in such prices—caused by the unstable nature of world oil markets—will reduce the anticipated supply response. For example, although a great many experts are predicting prices in the \$18-\$20 range through 1990, I am told that most major oil companies are making their investment decisions based on price thresholds of \$15 and less. In addition, investors and lenders will be reluctant to make capital commitments on the basis of unreliable revenue predictions. Based on recent experience, lenders in producing states will be cautious in making loan commitments. Furthermore, the total resources available for exploration loans will be substantially reduced due to reluctance by banks outside the producing states to purchase energy loans initiated by regional lenders.

This suggests the possibility of a supply-constrained gas market in the not too distant future. If this occurs, the supply inadequacies may be self-correcting. If supplies are so short as to back out the dual-fired gas market, peak seasonal prices will rise to the level of No. 2 fuel oil or higher thereby stimulating additional supplies. Further, higher seasonal prices will increase incentives to develop additional storage capacity and supplemental peak shaving supplies.

In conclusion, the low-level and unpredictability of future oil prices may cause a supply-constrained gas market in the near-term. However, if current regulatory reforms are allowed to continue, supply shortages will be more evenly distributed throughout the interstate pipeline network; essential gas users will not suffer gas curtailments; the industry will make necessary adjustments to changing market conditions; and we will not see a recurrence of the hardships that resulted from the gas shortages of the mid-1970s.

6. P. HOLTBERG, T. WOODS, A. ASHBY, GAS RESEARCH INSIGHTS: GRI BASELINE PROJECTIONS OF U.S. ENERGY SUPPLY AND DEMAND TO THE YEAR 2000, GAS RESEARCH INSTITUTE (Dec. 1986).